

Service Manual

**CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS**



**ORDER NO.
ARP-832-0**

STEREO AMPLIFIER

SA-560(BK)

SA-560

MODEL SA-560 [BK] COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS;

Type	Applicable model		Power requirement	Destination
	SA-560 [BK]	SA-560		
HE	○	○	AC220V, 240V (switchable)	European continent
HB	○	○	AC240V, 220V (switchable)	United Kingdom
S	○	○	AC110V, 120V, 220V, 240V (Switchable)	General export
KC	○	—	AC120V only	Canada
HEZ	○	○	AC220V 240V (switchable)	West Germany
YP	○	—	AC240V only	Australia

- This service manual is applicable to the HE, HB and S types.
As to the KC, HEZ, YP types, please refer to the additional service manual (ARP-833).
- As to the HB, S types, please see page 22.
- SA-560 [BK] is the same as the SA-560 except for the exterior design (color).

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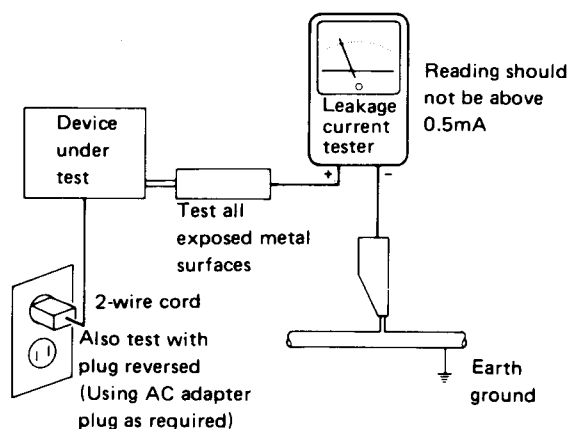
1. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a Δ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. SPECIFICATIONS

Amplifier Section

Continuous average power output is 30 watts* per channel, min., at 8 ohms from 40 Hertz to 20,000 Hertz with no more than 0.5% total harmonic distortion.

Continuous Power Output (both channels driven)

T.H.D. 0.5%, 1 kHz, 8 Ω 40 W per channel

T.H.D. 0.5%, 20 Hz to 20 kHz, 8 Ω 30 W per channel

DIN, Continuous Power Output at 1 kHz (both channels driven)

T.H.D. 1%, 1 kHz, 8 Ω 40 W per channel

Input (Sensitivity/Impedance)

PHONO 2.5 mV/50 k Ω

TUNER, TAPE PLAY ADAPTOR IN 150 mV/50 k Ω

Phono Overload Level (T.H.D. 0.1%, 1 kHz)

..... 150 mV

Output (Level/Impedance)

Headphone 67 mV/8 Ω

Frequency Response

PHONO (RIAA Equalization)

..... 20 Hz to 20 kHz ± 0.5 dB

TUNER, ADAPTOR IN, TAPE PLAY

..... 20 Hz to 70 kHz $\pm \frac{1}{3}$ dB

Tone Control

BASS ± 10 dB (100 Hz)

TREBLE ± 10 dB (10 kHz)

Loudness Contour (Volume control set at -40 dB position)

100 Hz +6 dB

10 kHz +3 dB

Hum and Noise (IHF, short circuited, A network)

PHONO 72 dB

ADAPTOR IN, TUNER, TAPE PLAY 98 dB

Hum and Noise (DIN, continuous power / 50 mW)

PHONO 68 dB/60 dB

ADAPTOR IN, TUNER, TAPE PLAY 82 dB/62 dB

Speaker Load Impedance

A or B 6 - 16 Ω

A + B 6 - 16 Ω

Miscellaneous

Power Requirements

HE model a.c. 220 V $\sim$, 50/60 Hz

HB, YP models a.c. 240 V $\sim$, 50/60 Hz

S, S/G models $\sim$ AC 110 V/120 V/220 V/240 V
(switchable), 50/60 Hz

KU, KC models AC 120 V, 60 Hz

Power Consumption

HE model 240 W

HB, YP models 240 W

S, S/G models 100 W

KC model 150 W (CSA)

Dimensions 420 (W) x 98 (H) x 230 (D) mm

16-1/2 (W) x 3-7/8 (H) x 9-1/8 (D) in

Weight (without package) 4 kg (8 lb 13 oz)

Furnished Parts

Operating Instructions 1

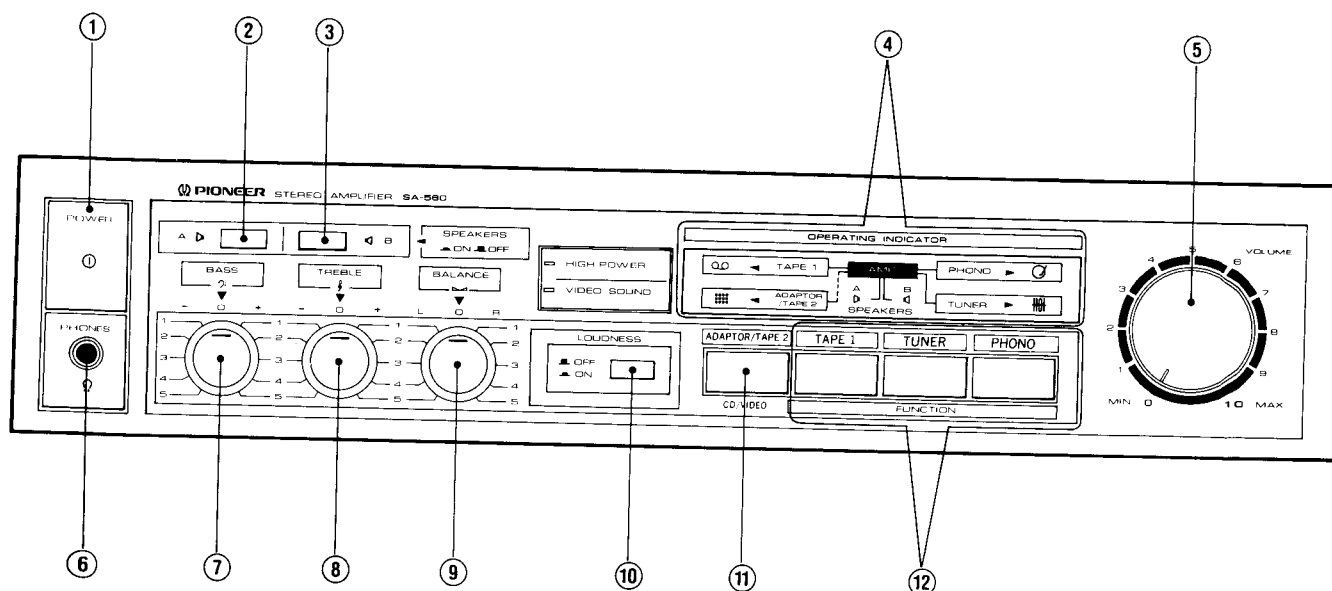
NOTE:

- Specifications and design subject to possible modification without notice due to improvements.
- *Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Claims for Amplifier.

3. FRONT PANEL FACILITIES

FRONT PANEL

Indications on the actual unit may differ from those in the illustration. However, operating procedures are the same.



① POWER switch

Press to turn power to the unit ON and OFF.

Depressed position (ON):

Power is supplied to the unit.

Released position (OFF):

Power to the unit is disconnected.

② SPEAKERS A selector switch

Use this switch to listen to the speaker systems connected to the SPEAKERS A terminals.

[ON] — Depressed position: Sound is heard from speaker systems.

[OFF] — Released position: No sound is heard from speaker systems. Set to this position when listening with headphones.

③ SPEAKERS B selector switch

Use this switch to listen to the speaker systems connected to the SPEAKERS B terminals.

[ON] — Depressed position: Sound is heard from the speaker systems.

[OFF] — Released position: No sound is heard from the speaker systems. Set to this position when listening with headphones.

④ Indicators

The indicators light to show the positions of the FUNCTION switches and ADAPTOR/TAPE2 switch.

⑤ VOLUME control

Use to adjust volume level.

⑥ PHONES jack

When using headphones, insert their plug into this jack.

⑦ BASS tone control

Use to adjust the low-frequency tone. The central "0" position is the flat (normal) position. When turned to the right, low-frequency tones are emphasized; when turned to the left, low-frequency tones are de-emphasized.

⑧ TREBLE tone control

Use to adjust the high-frequency tone.

The central "0" position is the flat (normal) position. When turned to the right, high-frequency tones are emphasized; when turned to the left, high-frequency tones are de-emphasized.

⑨ BALANCE control

Should normally be left in the center position. Adjust balance if the sound is louder from one of the speakers. If the right side is louder, turn toward the left position and if the left side is louder, turn toward the right position.

⑩ LOUDNESS switch

Use when listening at low volume levels.

[OFF] — Released position: Should normally be left in this position.

[ON] — Depressed position: Boosts low and high frequencies to give added punch to playback even at low volume.

⑪ ADAPTOR/TAPE2(/CD/VIDEO) switch

Use when there is an adaptor component (graphic equalizer, etc.), compact disc player, video cassette recorder or tape deck connected to the ADAPTOR/TAPE 2 terminals.

[OFF] — ADAPTOR/TAPE2 indicator goes out: When not in use.

[ON] — ADAPTOR/TAPE2 indicator lights: When using the adaptor component or listening to the component connected to the ADAPTOR/TAPE2 terminals.

NOTE:

When no connections are made to the ADAPTOR/TAPE 2 terminals, or when they are not in use, be sure to set this switch to the OFF position. (No sound will be heard if it is set to the ON position.)

⑫ FUNCTION switches

Use to select playback source.

[PHONO] — Press when listening to record playback on a turntable.

[TUNER] — Press when listening to AM or FM broadcasts with a tuner.

[TAPE 1] — Press when listening to tape playback with a tape deck.

NOTE:

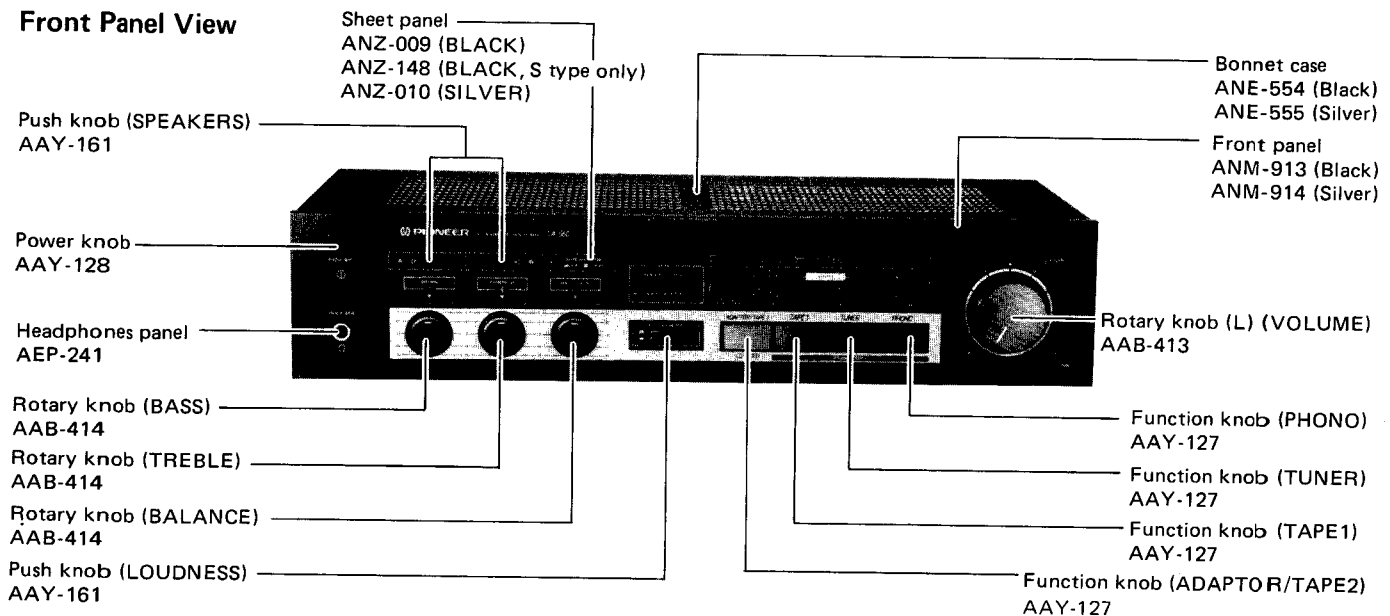
Function switches should be pressed firmly; otherwise, all the function indicators will light, and no output will be produced. If this occurs, press the desired function switch again.

4. PARTS LOCATION

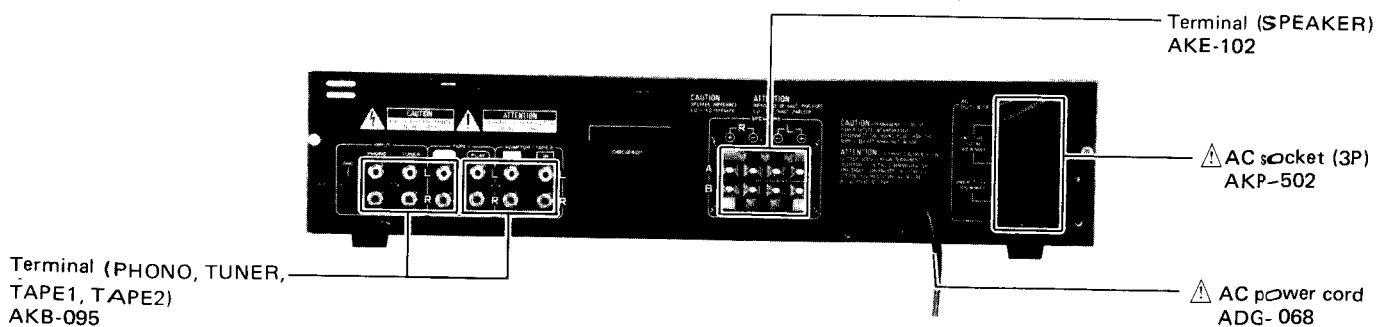
NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★.
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

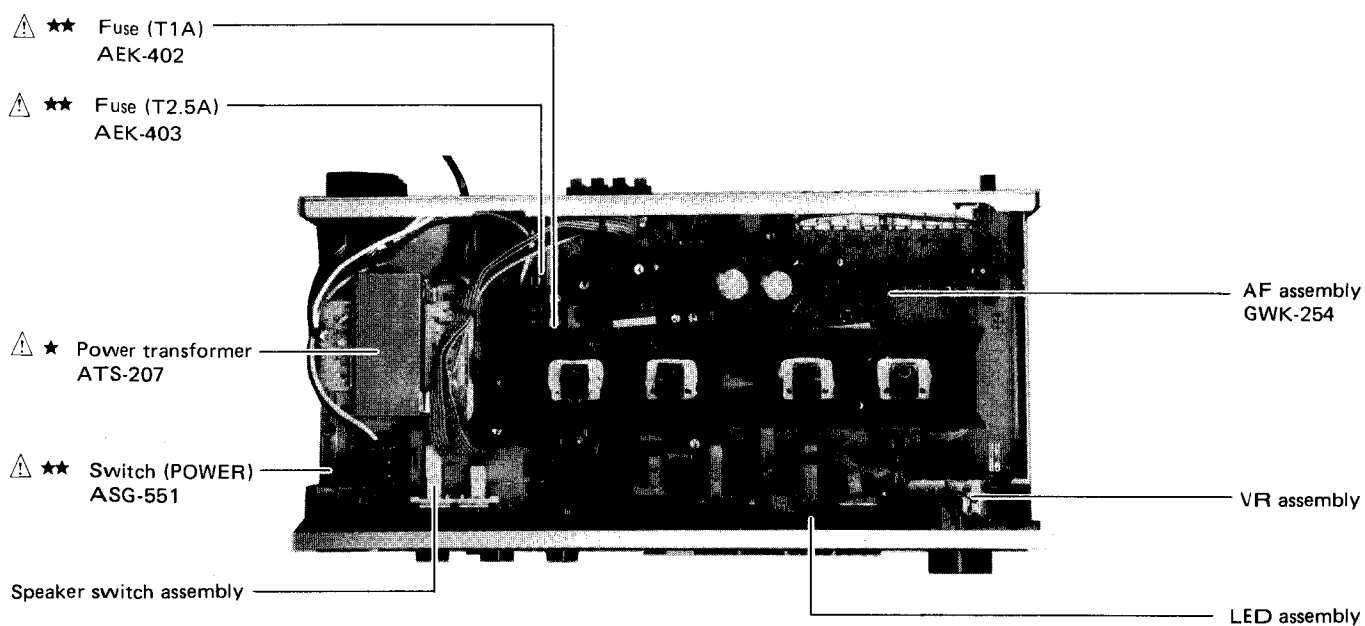
Front Panel View



Rear Panel View

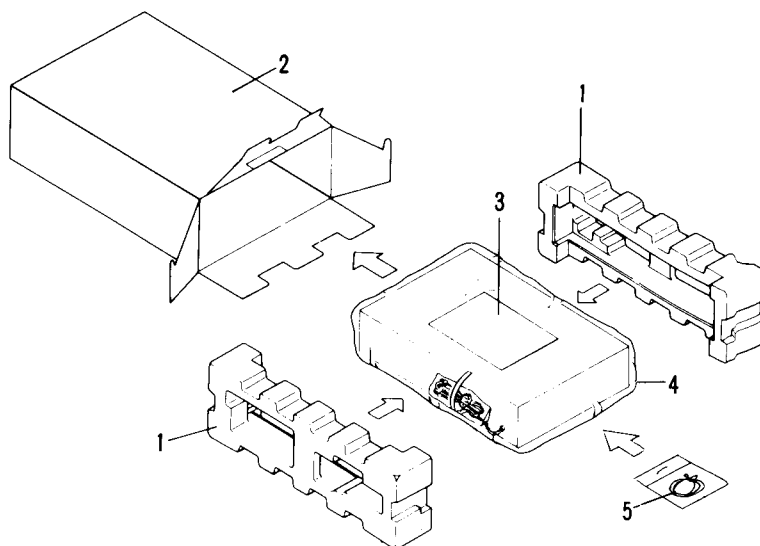


Top View



5. PACKING

Mark	No.	Part No.	Description
	1	AHA-340	Front rear pad
	2	AHE-529	Packing case (Black)
		AHE-530	Packing case (Silver)
	3	ARE-132	Operating instructions
	4	AHG-131	Polyethylene sheet
	5	AEA-057	Cable



6. EXPLODED VIEW

- Parts without part number cannot be supplied.
- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★.
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	★	1 GWK-254	AF assembly		102		Headphone assembly
		2 ATS-207	Power transformer (AC220V/240V)		103		Speaker switch assembly
		3 AKP-502	AC socket (3P)		104		LED assembly
	★★	4 AEK-402	FU1 Fuse (T1A)		105		Volume assembly
	★★	5 AEK-403	FU2 Fuse (T2.5A)		106		Bottom plate
	6	AEC-784	Leg assembly		107		Trans frame
	7	AAB-413	Rotary knob L (VOLUME)		108		Right frame
	8	AAB-414	Rotary knob M		109		Heat sink
	9	AAV-127	Function knob		110		Rear panel
	10	AAV-128	Power knob		111		P.C.B. holder
	11	AAV-161	Push knob				
	12	AEP-241	Headphones panel				
	13	ANE-554	Bonnet case (Black)				
		ANE-555	Bonnet case (Silver)				
	14	ANM-913	Front panel (Black)				
		ANM-914	Front panel (Silver)				
	15	ANR-993	Panel base				
	16	ANZ-009	Sheet panel (Black)				
		ANZ-148	Sheet panel (Black, S type only)				
		ANZ-010	Sheet panel (Silver)				
	17	ABH-041	Coil spring				
	18	ABH-155	Coil spring				
	19	ABN-093	Nut				
	20	ADG-068	AC power cord				
	21	BBZ30P080FZK	Screw (3 x 8)				
	22	NK70FUC	Nut				
	23	NK90FUC	Nut				
	24	VMZ30P060FMC	Screw (3 x 6)				
	25	AEC-818	Mica wafer				
	★★	26 ASG-551	Push switch (POWER)				
		27 ACG-502	Ceramic capacitor (C1)				
	28	AEC-294	Condenser cover				
	29	ABA-258	Screw				

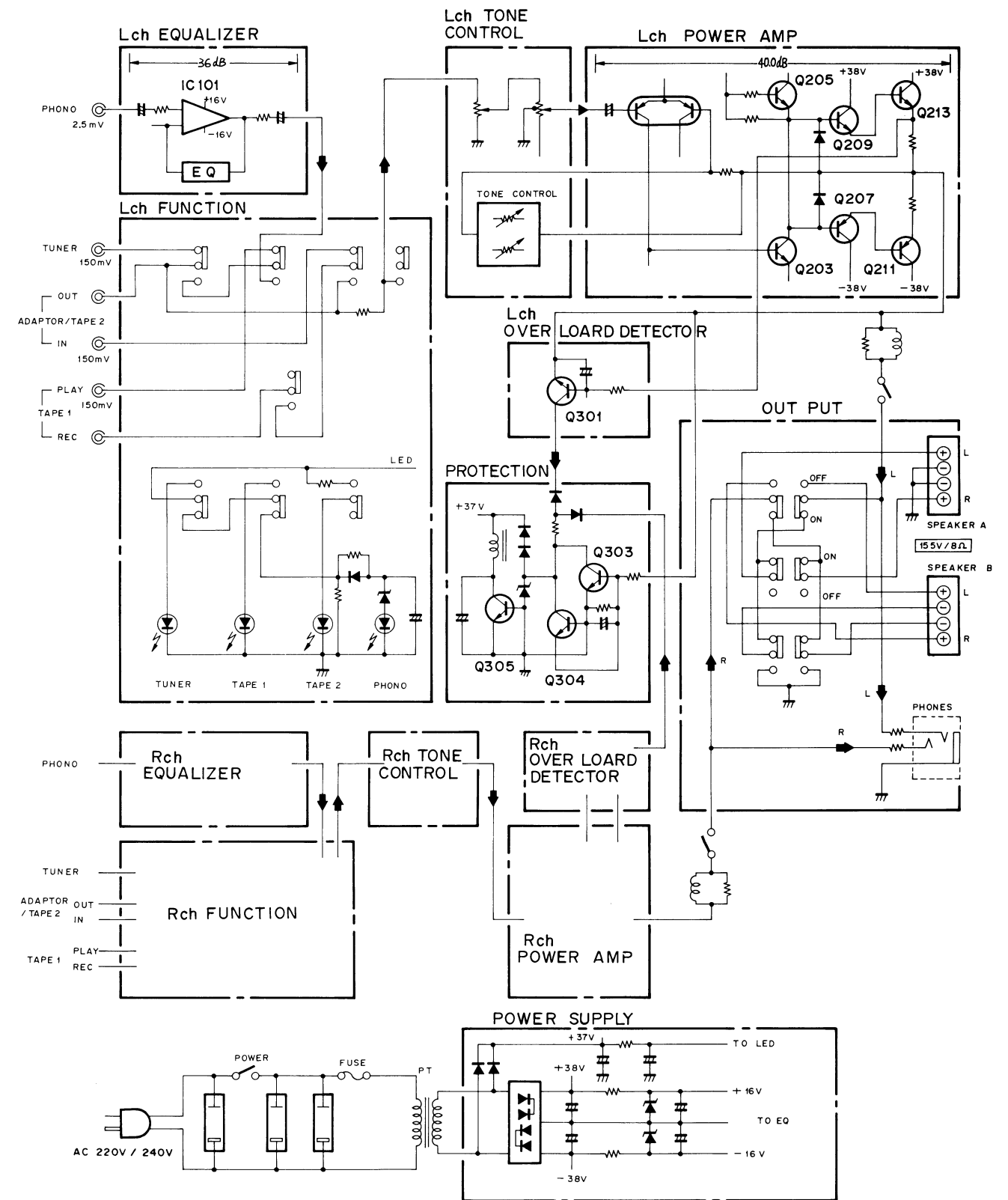
Diagram of the rear panel of the Philips RR50 cassette recorder, showing various input and output jacks and their voltage levels:

- PHONO**: 2,5 mV
- TUNER**: 150 mV
- ADAPTOR / TAPE 2**:
 - OUT**: 150 mV
 - IN**: 150 mV
- TAPE 1**:
 - PLAY**: 150 mV
 - REC**: 150 mV
- PHONO**
- TUNER**
- ADAPTOR / TAPE 2**:
 - OUT**
 - IN**
- TAPE 1**:
 - PLAY**
 - REC**
- AC 220V**

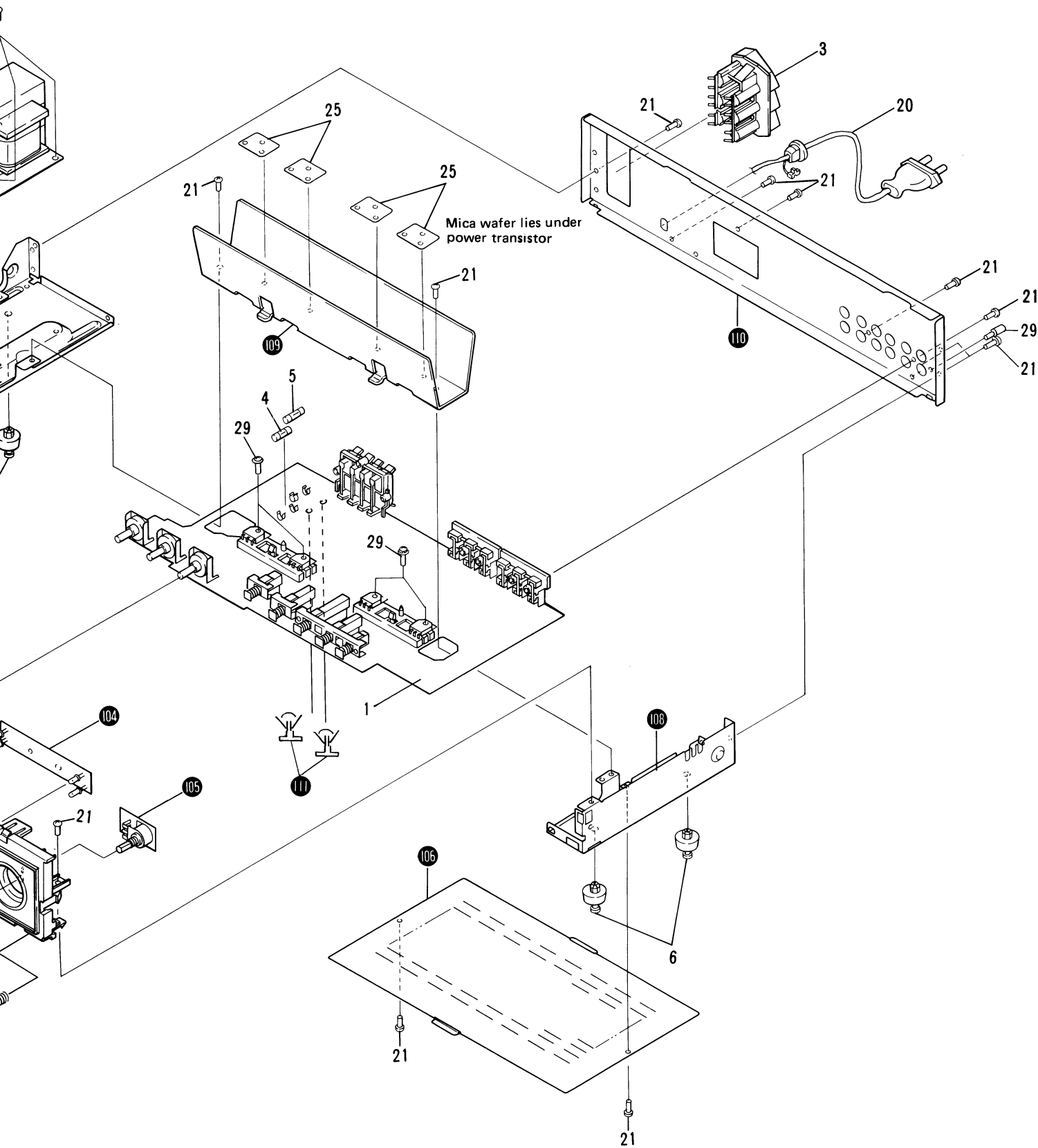


7. BLOCK DIAGRAM

A



D



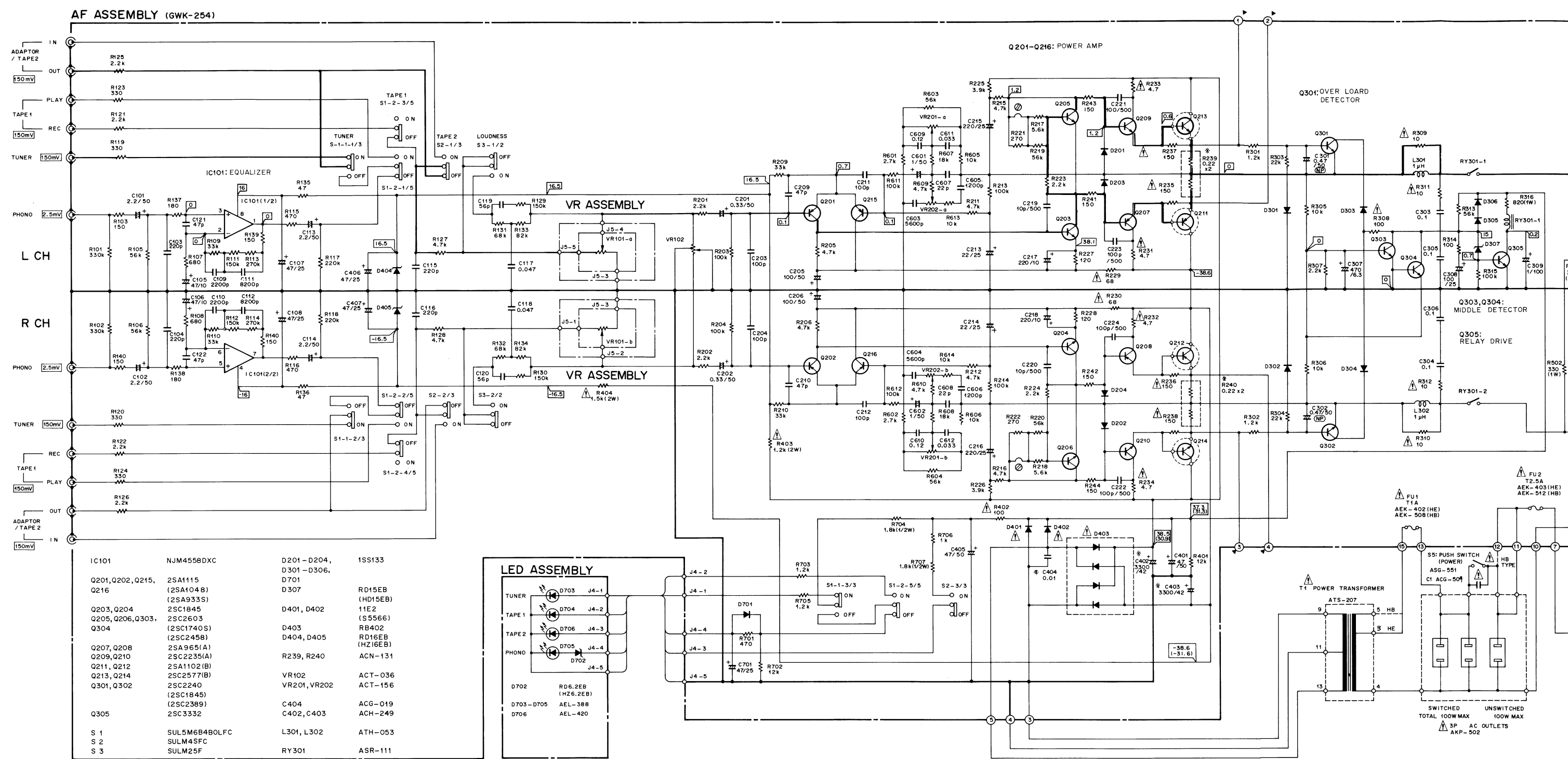
8. SCHEMATIC DIAGRAM

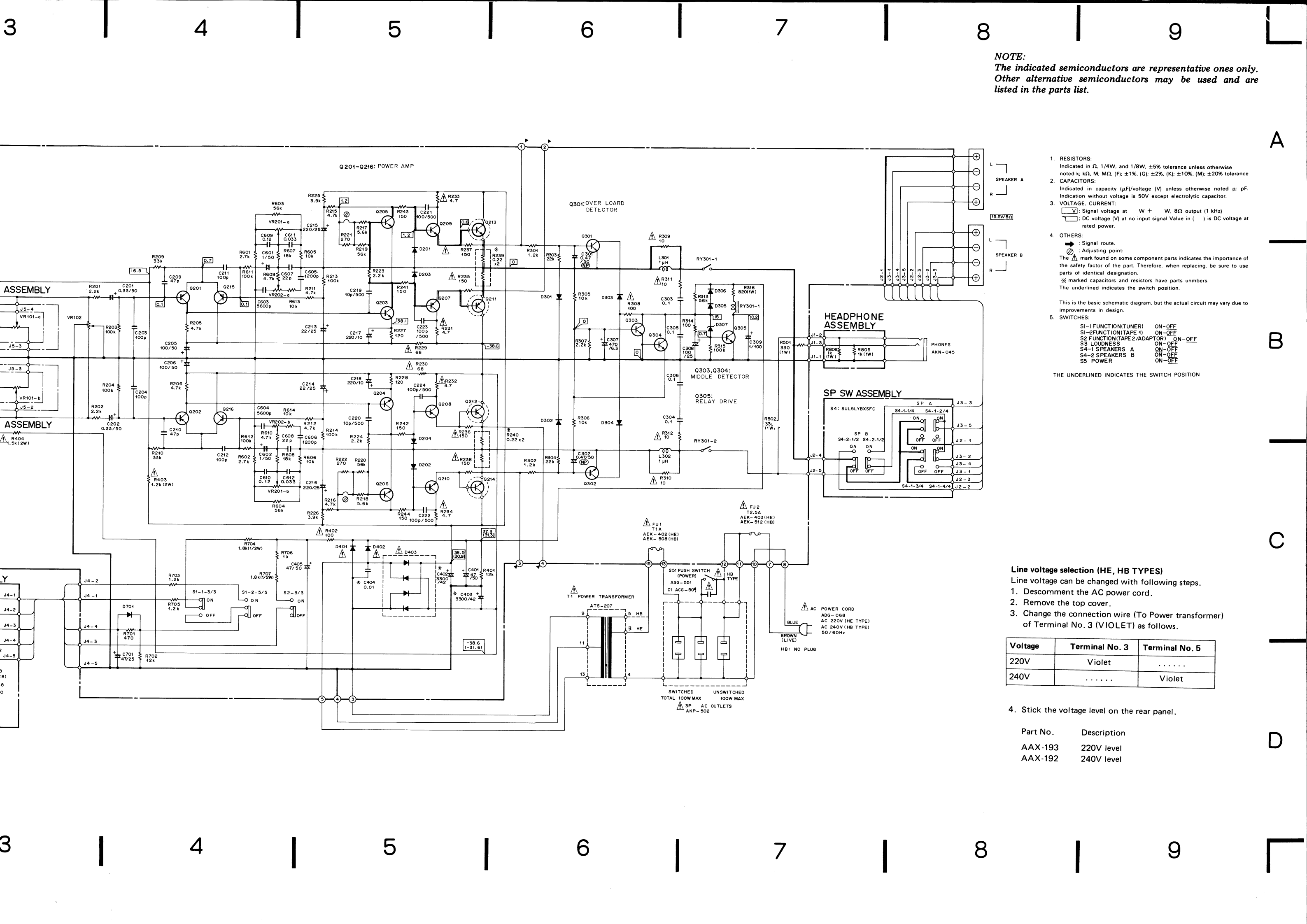
A

B

C

D





NOTE:
The indicated semiconductors are representative ones only.
Other alternative semiconductors may be used and are
listed in the parts list.

1. RESISTORS:
Indicated in Ω , 1/4W, and 1/8W, $\pm 5\%$ tolerance unless otherwise noted k; k Ω , M; M Ω , (F); $\pm 1\%$, (G); $\pm 2\%$, (K); $\pm 10\%$, (M); $\pm 20\%$ tolerance
2. CAPACITORS:
Indicated in capacity (μ F)/voltage (V) unless otherwise noted p; pF.
Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT:
V: Signal voltage at W + W, 8 Ω output (1 kHz)
DC voltage (V) at no input signal Value in () is DC voltage at rated power.
4. OTHERS:
Signal route.
Adjusting point.
The mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
marked capacitors and resistors have parts numbers.
The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES:
S1-FUNCTION(TUNER) ON-OFF
S2-FUNCTION(TAPE 2/ADAPTOR) ON-OFF
S3 LOUDNESS ON-OFF
S4-1 SPEAKERS A ON-OFF
S4-2 SPEAKERS B ON-OFF
S5 POWER ON-OFF

THE UNDERLINED INDICATES THE SWITCH POSITION

Line voltage selection (HE, HB TYPES)

Line voltage can be changed with following steps.

1. Descomment the AC power cord.
2. Remove the top cover.
3. Change the connection wire (To Power transformer) of Terminal No. 3 (VIOLET) as follows.

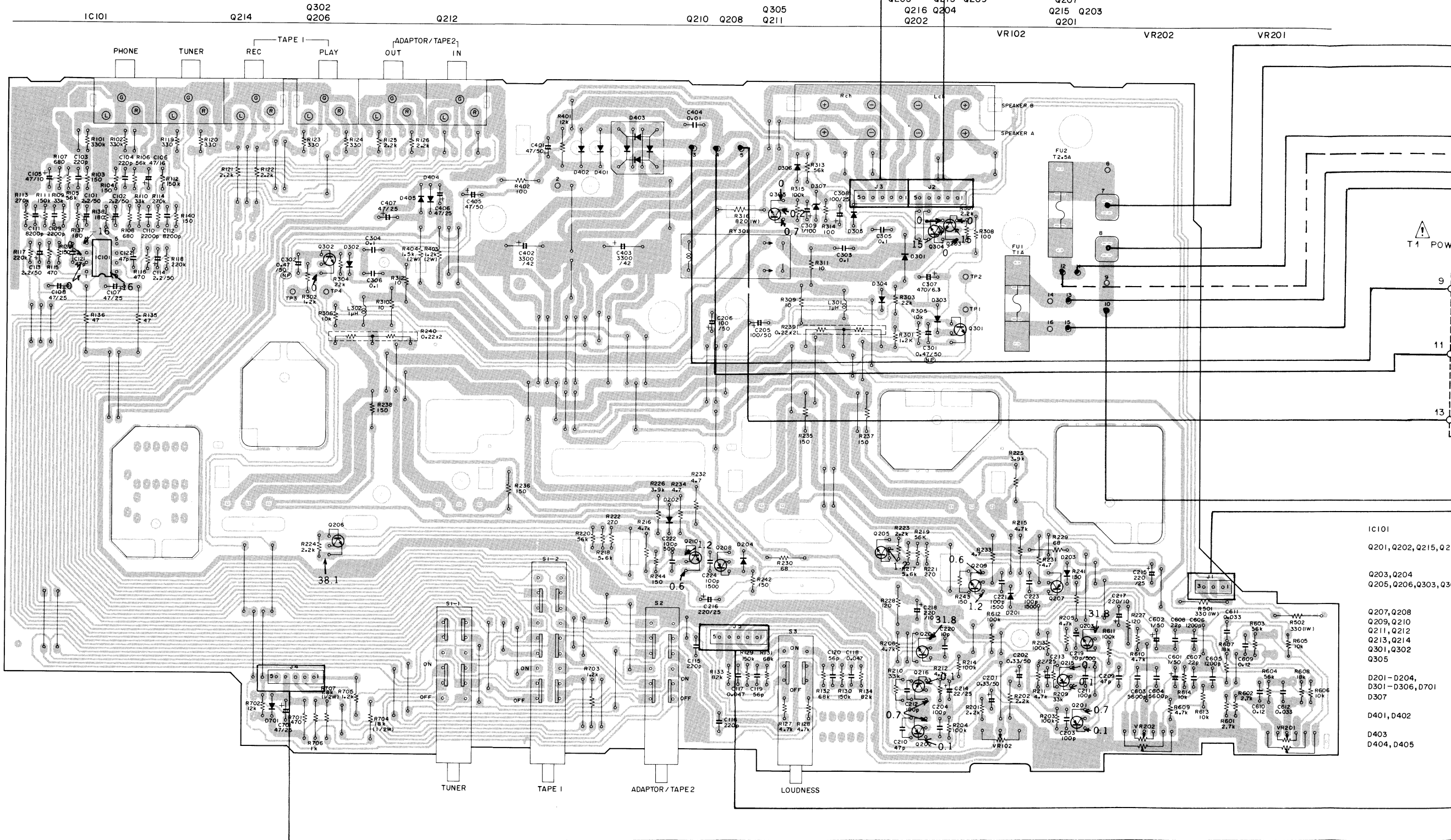
Voltage	Terminal No. 3	Terminal No. 5
220V	Violet	.....
240V	.....	Violet

4. Stick the voltage level on the rear panel.

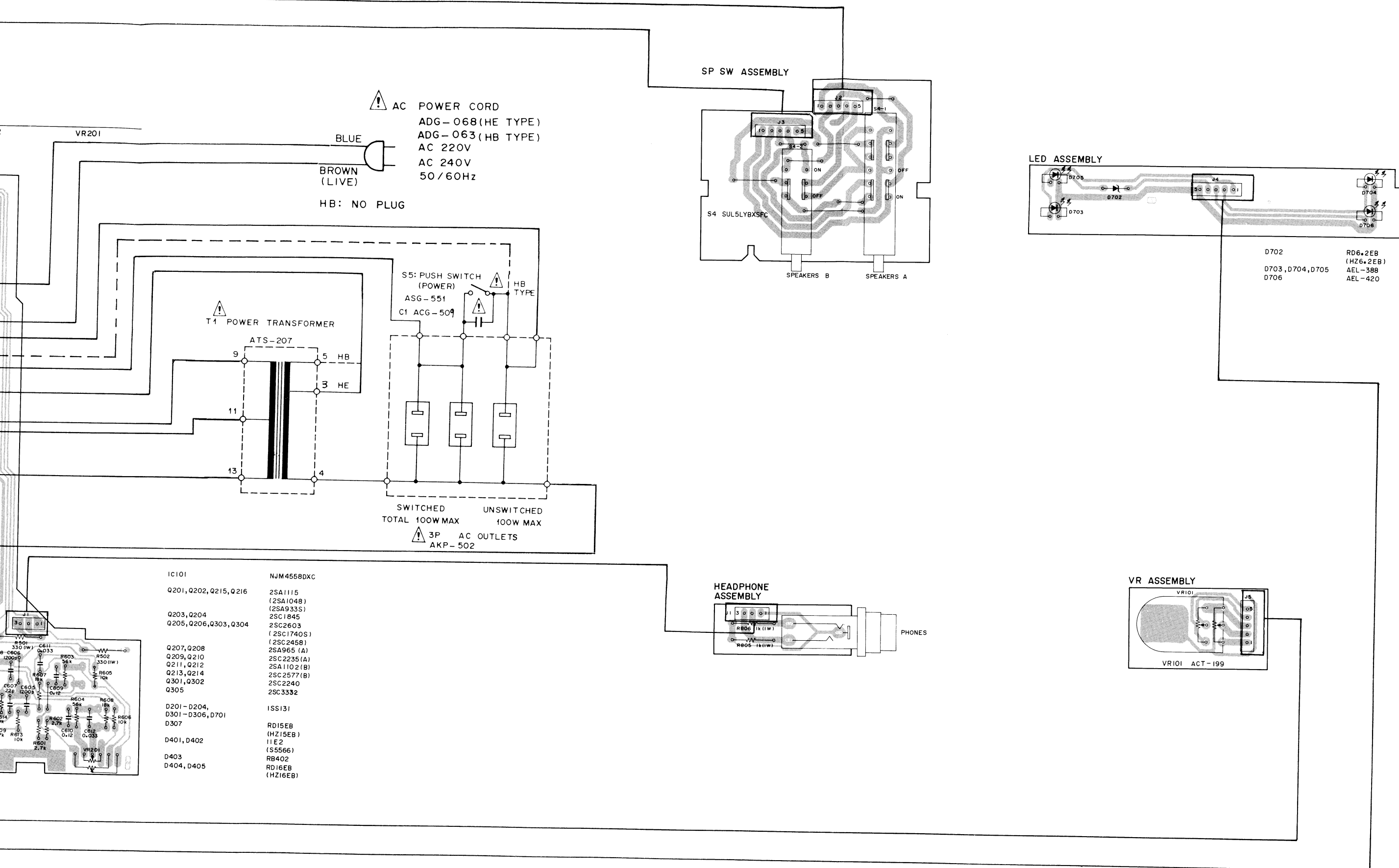
Part No.	Description
AAX-193	220V level
AAX-192	240V level

9. P.C.BOARDS CONNECTION DIAGRAM

AF ASSEMBLY (GWK-254)



IC101
Q201, Q202, Q215, Q216
Q203, Q204
Q205, Q206, Q303, Q305
Q207, Q208
Q209, Q210
Q211, Q212
Q213, Q214
Q301, Q302
Q305
D201-D204,
D301-D306, D701
D307
D401, D402
D403
D404, D405



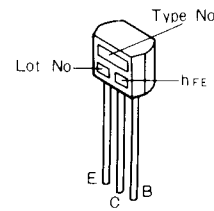
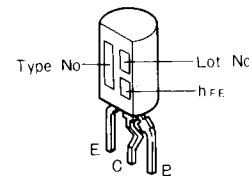
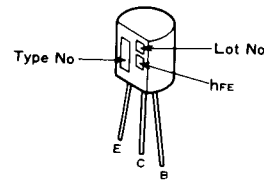
A

B

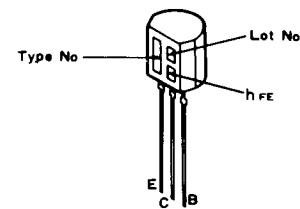
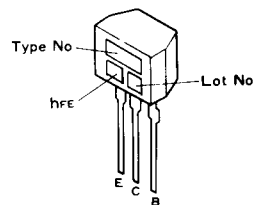
C

D

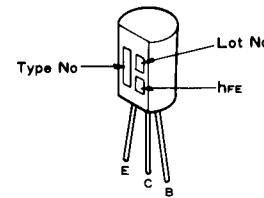
External Appearances of Transistor and ICs

2SA1115
2SC26032SA965 (A)
2SC2235 (A)2SC2240
2SC2389

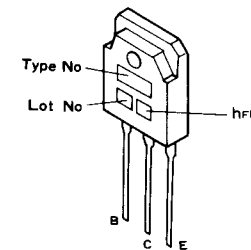
2SC3332

2SA933S
2SC1740S

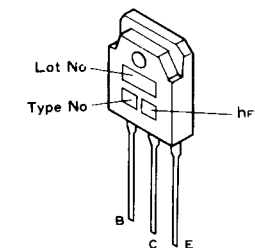
2SC1845



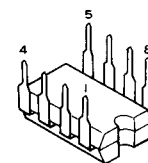
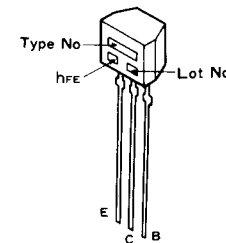
2SA1102



2SC2577



NJM4558DXC

2SA1048
2SC2458

10. ELECTRICAL PARTS LIST

NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.
 - Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56 × 10 ¹	561	RD4PS	561J
47kΩ	47 × 10 ³	473	RD4PS	473J
0.5Ω	0R5		RN2H	0R5K
1Ω	010		RS1P	010K
 - Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	562 × 10 ¹	5621	RN4SR	5621F
--------	-----------------------	------	-------	-------
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks $\star\star$ and $\star$.
 - $\star\star$ GENERALLY MOVES FASTER THAN $\star$.
 - This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts List

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	AF Assembly	GWK-254
	Speaker Switch Assembly	no supply
	Power Switch Assembly	no supply
	LED Assembly	no supply
	Headphone Assembly	no supply
	Volume Assembly	no supply

OTHERS

Mark	Symbol & Description	Part No.
Δ $\star$	T1 Power transformer (AC220V/240V)	ATS-207
Δ	AC Socket (3P)	AKP-502
Δ $\star\star$	FU1 Fuse (T1A)	AEK-402
Δ $\star\star$	FU2 Fuse (2.5A)	AEK-403
Δ	AC Power cord	ADG-068
Δ $\star\star$	S5 Push switch (POWER)	ASG-551
Δ	C1 Ceramic capacitor	ACG-502

AF Assembly (GWK-254)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
$\star\star$	IC101	NJM4558DXC
$\star\star$	Q211, Q212	2SA1102
$\star\star$	Q201, Q202, Q215, Q216	2SA1115 (2SA1048) (2SA933S)
$\star\star$	Q207, Q208	2SA965 (A)
$\star\star$	Q203, Q204	2SC1845
$\star\star$	Q209, Q210	2SC2235 (A)
$\star\star$	Q301, Q302	2SC2240 (2SC1845) (2SC2389)

Mark	Symbol & Description	Part No.
$\star\star$	Q213, Q214	2SC2577
$\star\star$	Q205, Q206, Q303, Q304	2SC2603 (2SC1740S) (2SC2458)
$\star\star$	Q305	2SC3332
Δ $\star$	D403	RB402
$\star$	D307	RD15EB (HZ15EB)
$\star$	D404, D405	RD16EB (HZ16EB)
$\star$	D201 - D204, D301 - D306 D701	1SS131 1SS131
Δ $\star$	D401, D402	11E2 (S5566)

SWITCHES

Mark	Symbol & Description	Part No.
$\star\star$	RY301 Relay	ASR-111
$\star\star$	S3 Push switch (LOUDNESS)	SULM2SF
$\star\star$	S2 Push switch (TAPE2/ ADAPTOR)	SULM4SFC
$\star\star$	S1 Push switch (TUNER, TAPE1)	SUL5M6B4B0LFC

COILS

Mark	Symbol & Description	Part No.
	L301, L302	ATH-053

CAPACITORS

Mark	Symbol & Description	Part No.
	C404 (0.01/250V) C402, C403 (3300μF/42V) C219, C220	ACG-019 ACH-249 CCCSL100D500 (CCDSL100D500) CCCSL101J50 (CCDSL101J50) CCCSL101K500 (CCDSL101K500)
	C203, C204, C211, C212	
	C221 — C224	
	C607, C608	CCCSL220J50 (CCDSL220J50) CCCSL221J50 (CCDSL221J50) CCCSL470J50 (CCDSL470J50) CCCSL560J50 (CCDSL560J50) CEANPR47M50
	C103, C104, C115, C116	
	C121, C122, C209, C210	
	C119, C120	
	C301, C302	
	C201, C202 C309 C601, C602 C308 C205, C206	CEASR33M50 CEAS010M100 CEAS010M50 CEAS101M25 CEAS101M50
	C101, C102, C113, C114 C213, C214 C217, C218 C215, C216 C105, C106	CEAS2R2M50 CEAS220M25 CEAS221M10 CEAS221M25 CEAS470M10
	C107, C108, C406, C407, C701 C401, C405 C307 C303 — C306 C605, C606	CEAS470M25 CEAS470M50 CEAS471M6 CQMA104K50 CQMA122K50
	C609, C610 C109, C110 C611, C612 C117, C118 C603, C604	CQMA124K50 CQMA222J50 CQMA333K50 CQMA473K50 CQMA562K50
	C111, C112	CQMA822J50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★★	VR102 (BALANCE)	ACT-036
★★	VR201, VR202 (BASS, TREBEL)	ACT-156
	R239, R240 (0.22Ω x 2)	ACN-131
	R704, R707	RD1/2PM182J
⚠	R229, R230, R309 — R312, R402 R308	RD1/4PMF □□□J RD1/4PMF101j
	R121, R122, R135, R136, R202, R215, R216, R225 — R228, R401, R701, R703, R705, R706	RD1/4PM □□□J
⚠	R231 — R238 R316, R501, R502 R403, R404 Other resistors	RFA1/4PS151J RS1LMF □□□J RS2LMF □□□J RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal (PHONO, TUNER, TAPE1, TAPE2)	AKB-095
	Terminal (SPEAKER)	AKE-102
	Mica wafer	AEC-818
	Screw	ABA-258

Speaker Switch Assembly

SWITCH

Mark	Symbol & Description	Part No.
★★	S4 Push switch (SPEAKER A,B)	SUL5LYBXSFC

LED Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D703 — D705	AEL-451
★	D706	AEL-426
★	D702	RD6.2EB (HZ6.2EB)

Headphone Assembly

RESISTOR

Mark	Symbol & Description	Part No.
	R805, R806	RS1LMF102J

OTHER

Mark	Symbol & Description	Part No.
	Jack (PHONES)	AKN-045

Volume Assembly

RESISTOR

Mark	Symbol & Description	Part No.
★	VR101 (VOLUME)	ACT-199

11. FOR HB, S TYPES

The HB, S types are the same as the HE type with the exception of the following sections.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.			Remarks
		HE type	HB type	S type	
⚠ ★	T1 Power transformer (220V/240V) (110V/120V/220V/240V)	ATS-207	ATS-207	.....	
⚠	AC socket (AC OUTLETS)	AKP-502	AKP-505	AKP-504	
⚠ ★★	S6 Line voltage selector	.....	.....	AKX-504	
⚠ ★★	FU1 Fuse (T1A) (1.6A)	AEK-402	AEK-508	.....	
⚠ ★★	FU2 Fuse (T2.5A) (1.6A)	AEK-403	AEK-512	.....	
	Sheet panel (Black)	ANZ-009	ANZ-009	ANZ-148	
	Sheet panel (Silver)	ANZ-010	ANZ-010	ANZ-010	
	Operating instructions (English)	.....	ARB-695	ARB-695	
	(Spanish)	.....	.....	ARC-099	
	(English/French/German/Italian)	ARE-132	.....	.....	
⚠	AC power cord	ADG-068	ADG-063	ADG-073	
	Screw (3 x 10)	.....	.....	VTZ30P100FZK	

SCHEMATIC DIAGRAM FOR S TYPE

